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Serial No.: 10/032,357

Confirmation No.: 4965

Filed: 21 December 2001

For: METHODS FOR PLANARIZATION OF GROUP VIII METAL-CONTAINING SURFACES USING
OXIDIZING GASES

Remarks

The Office Action mailed June 14, 2005 has been received and reviewed. Claims 15, 17, 26, 30, 32, 34, 38 and 41 having been amended, and claims 1, 8, 11, 23, 27-29 having been canceled, the pending claims are claims 2-7, 9, 10, 12-22, 24-26 and 30-43. Reconsideration and withdrawal of the rejections are respectfully requested.

Claim Objection

The Examiner objected to claims 15, 17, 26, 32, 34, 38 and 41. These claims having been amended, this rejection is rendered moot. Because claim 30 included similar language, even though the Examiner did not reject this claim, a similar amendment has been made in the interest of expediting prosecution.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 2-7, 9-10, 12-22, 24-26 and 38-40 under 35 U.S.C. §103 as being unpatentable over Beitel et al. (U.S. Patent Publication No. 2002/0017063 A1) in view of Russel et al. (U.S. Patent No. 6,395,194). This rejection is respectfully traversed.

Independent claims 15, 17, 26, and 38 recite a method that results in selectively removing a Group VIII metal-containing surface relative to materials containing other metals (e.g., BPSG or TEOS) at a selectivity ratio of at least 10:1. Independent claim 16 recites a method that forms a substantially defect-free surface.

At page 4 of the Office Action, the Examiner stated that Beitel et al. teach forming a substantially defect-free surface citing to several figures and paragraphs. However, there is no such teaching or suggestion in any of the cited figures or paragraphs.

At page 5, paragraph 1, of the Office Action, the Examiner correctly stated that Beitel et al. do not specifically show the selectivity ratio as claimed....but stated that both Beitel et al. and Russell et al. teach selectively removing material. Applicants respectfully emphasize that there is no teaching or suggestion of the significant selectivity ratio (at least 10:1) that

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Applicants are able to obtain. There is no teaching or suggestion in either Beitel et al. or Russell et al. of how one would carry out a method to obtain such a significant selectivity ratio.

At page 5, paragraph 2, of the Office Action, the Examiner further stated that "one of ordinary skill in the art would have found it prima facie obvious at the time of the invention to select the optimized thickness..." and refers to the thickness of a layer in a semiconductor as a result-effective variable. Applicants do not understand. Applicants' claims do not recite a thickness. The Examiner is requested to clarify how thickness is relevant to the claimed invention.

At page 5, paragraph 3, of the Office Action, the Examiner stated that the teachings of Beitel et al. when combined with Russell et al. would render it obvious to "enhance the removal rate . . ." of the substrate surface. Applicants do not understand. Applicants' claims do not recite a removal rate. The Examiner is requested to clarify how removal rate is relevant to the claimed invention.

Thus, it is respectfully submitted that the combination of Beitel et al. with Russell et al. do not teach or suggest Applicants' claimed invention.

The Examiner rejected claims 30-31 and 34-37 under 35 U.S.C. §103 as being unpatentable over Beitel et al. (U.S. Patent Publication No. 2002/0017063 A1) in view of Weast et al. ("CRC Handbook of Chemistry and Physics"). This rejection is respectfully traversed.

Independent claim 30 recites a method that results in selectively removing a Group VIII metal-containing surface relative to materials containing other metals at a selectivity ratio of at least 10:1. Independent claim 34 recites a method that results in selectively removing a Group VIII metal-containing surface relative to materials containing other metals at a selectivity ratio of about 20:1 to about 100:1.

At page 7, paragraph 2, of the Office Action, the Examiner correctly stated that Beitel et al. do not specifically show the selectivity ratio as claimed....but stated that both Beitel et al. and Russell et al. teach selectively removing material. First, it is not clear why the

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Examiner refers to Russell et al. since the Examiner did not use Russell et al. in the rejection; rather the Examiner used Weast et al. in combination with Beitel et al. Applicants respectfully emphasize that there is no teaching or suggestion of the significant selectivity ratio (at least 10:1 or of about 20:1 to about 100:1) that Applicants are able to obtain. There is no teaching or suggestion in either Beitel et al. or Weast et al. (or Russell et al.) of how one would carry out a method to obtain such a significant selectivity ratio.

At page 7, paragraph 3, of the Office Action, the Examiner further stated that "one of ordinary skill in the art would have found it prima facie obvious at the time of the invention to select the optimized thickness..." and refers to the thickness of a layer in a semiconductor as a result-effective variable. Applicants do not understand. Applicants' claims do not recite a thickness. The Examiner is requested to clarify how thickness is relevant to the claimed invention.

At page 8 of the Office Action, the Examiner stated that the selectivity ratio could be specified using routine experimentation. This is respectfully traversed. The selection of the parameters necessary (e.g., composition of the planarization composition, placement of the oxidizing gas, selection of the oxidizing gas, etc.) to reach such a significant selectivity ratio is more than mere routine experimentation. Furthermore, there is no teaching or suggestion in the cited documents as to how this could be done.

Thus, it is respectfully submitted that the combination of Beitel et al. with Weast et al. do not teach or suggest Applicants' claimed invention.

The Examiner rejected claim 7 under 35 U.S.C. §103 as being unpatentable over Beitel et al. (U.S. Patent Publication No. 2002/0017063 A1) and Weast et al. ("CRC Handbook of Chemistry and Physics") and further in view of Russell et al. (U.S. Patent No. 6,395,194). This rejection is respectfully traversed for the same reasons discussed above with respect to claim 30, from which claim 7 depends.

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The Examiner rejected claim 14 under 35 U.S.C. §103 as being unpatentable over Beitel et al. (U.S. Patent Publication No. 2002/0017063 A1) and Russel et al. (U.S. Patent No. 6,395,194) and further in view of Bruxvoort et al. (U.S. Patent No. 5,958,794). This rejection is respectfully traversed for the same reasons discussed above with respect to claim 15, from which claim 14 depends.

The Examiner rejected claims 41-43 under 35 U.S.C. §103 as being unpatentable over Beitel et al. (U.S. Patent Publication No. 2002/0017063 A1) in view of Bruxvoort et al. (U.S. Patent No. 5,958,794). This rejection is respectfully traversed.

Independent claim 41 recites a method that results in selectively removing a Group VIII metal-containing surface relative to materials containing other metals at a selectivity ratio of at least 10:1.

At page 10, paragraph 4, of the Office Action, the Examiner correctly stated that Beitel et al. do not specifically show the selectivity ratio as claimed....but stated that Beitel et al. teach selectively removing material. Applicants respectfully emphasize that there is no teaching or suggestion of the significant selectivity ratio (at least 10:1) that Applicants are able to obtain. There is no teaching or suggestion in either Beitel et al. or Bruxvoort et al. of how one would carry out a method to obtain such a significant selectivity ratio.

At page 10, paragraph 4, of the Office Action, the Examiner further stated that "one of ordinary skill in the art would have found it prima facie obvious at the time of the invention to select the optimized thickness..." and refers to the thickness of a layer in a semiconductor as a result-effective variable. Applicants do not understand. Applicants' claims do not recite a thickness. The Examiner is requested to clarify how thickness is relevant to the claimed invention.

Thus, it is respectfully submitted that the combination of Beitel et al. with Bruxvoort et al. do not teach or suggest Applicants' claimed invention.

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The Examiner rejected claims 32-33 under 35 U.S.C. §103 as being unpatentable over Small et al. (U.S. Patent Publication No. 2002/0111026 A1) in view of Weast et al. ("CRC Handbook of Chemistry and Physics") and Bruxvoort et al. (U.S. Patent No. 5,958,794). This rejection is respectfully traversed.

Independent claim 32 recites a method that results in selectively removing a Group VIII metal-containing surface relative to materials containing other metals at a selectivity ratio of at least 10:1.

At page 12, paragraph 2, of the Office Action, the Examiner stated that "one of ordinary skill in the art would have found it prima facie obvious at the time of the invention to select the optimized thickness..." and refers to the thickness of a layer in a semiconductor as a result-effective variable. Applicants do not understand. Applicants' claims do not recite a thickness. The Examiner is requested to clarify how thickness is relevant to the claimed invention.

At page 13 of the Office Action, the Examiner stated that the selectivity ratio could be specified using routine experimentation. This is respectfully traversed. The selection of the parameters necessary (e.g., composition of the planarization composition, placement of the oxidizing gas, selection of the oxidizing gas, etc.) to reach such a significant selectivity ratio is more than mere routine experimentation. Furthermore, there is no teaching or suggestion in the cited documents as to how this could be done.

Thus, it is respectfully submitted that the combination of Beitel et al. and Weast et al. in view of Bruxvoort et al. do not teach or suggest Applicants' claimed invention.

It is respectfully submitted that each claim recites a method that is neither taught nor suggested by the cited documents. Each claim recites language that relates to unexpected properties (e.g., to selectively remove the Group VIII metal-containing surface relative to materials containing other metals (e.g., BPSG or TEOS) at a selectivity ratio of at least 10:1, or at a selectivity ratio of about 20:1 to about 100:1, or to form a substantially defect-free surface).

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The methods of obtaining such results are not taught or suggested by any of the combinations of documents. Furthermore, there is no motivation to combine the cited documents to obtain the unexpected results recited in the amended claims. Even if there were a motivation, there is no expectation of success that such results would be obtained.

With respect to each of the rejections presented herein, it is respectfully submit that the combination of these documents in an obviousness rejection can only occur by the impermissible use of hindsight reasoning. In order to establish a *prima facie* case of obviousness, the references must teach or suggest all the claim limitations. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 U.S.P.Q. 81 at 93 ("Focusing on the obviousness of substitutions and differences instead of on the invention as a whole, . . . was a legally improper way to simplify the difficult determination of obviousness."). One cannot "simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant's structure as a template and selecting elements from references to fill the gaps." In re Gorman, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991). Further, both the suggestion for combining the teachings of the prior art to make the invention and the reasonable likelihood of its success must be founded in the prior art and not in the teachings of Appellants' disclosure. In re Dow Chem., 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). Here, the cited art neither suggests the combination of its teachings nor suggests the reasonable likelihood that such a combination would result in the present invention.

Applicants respectfully submit that there is simply no teaching, suggestion, or incentive indicated in any of the cited documents, in any combination that provides a motivation to combine their teachings to provide Applicants' claimed methods.

As recently reasserted in Princeton Biochemicals, Inc. v. Beckman Coulter, Inc. (Fed. Cir., No. 04-1493, June 9, 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention "as a whole." This "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the

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same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998).

This "as a whole" instruction in 35 U.S. §103 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might successfully break an invention into its component parts, then find a reference corresponding to each component. This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would discount the value of combining various existing features or principles in a new way to achieve a new result - often the essence of invention. *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004). Simply identifying the various elements of a claim in the cited references does not render a claim obvious. *Ruiz*, 357 F.3d at 1275. Instead, 35 U.S. §103 requires some suggestion or motivation in the prior art to make the new combination. *Rouffet*, 149 F.3d at 1355-56. Applicants submit that the Examiner has engaged in an improper part by part analysis of the claimed method.

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OXIDIZING GASES**Summary**

It is respectfully submitted that the pending claims 2-7, 9, 10, 12-22, 24-26 and 30-43 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
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Sept. 14, 2005
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CERTIFICATE UNDER 37 CFR §1.8:

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 14th day of September, 2005, at 9:35am (Central Time).

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